

Claims

1 1. A circuit for driving light emitting diodes comprising: an inductive storage device,
2 a switching regulator device, a rectifier, a filter, and a current sensing device.

1 2. The circuit of claim 1, wherein said inductive storage device is wire wound with
2 an inductance between about 22 and 220 micro henries.

1 3. The circuit of claim 1, wherein said switching regulator device comprises:
2 a) a reference voltage source;
3 b) an oscillation circuit;
4 c) an error amplifier; and
5 d) a power MOSFET.

1 4. The circuit of claim 1, wherein said switching regulator device is a CMOS PWM-
2 PFM-control step-up switching regulator.

1 5. The circuit of claim 1, wherein said rectifier is a Schottky diode.

1 6. The circuit of claim 1, wherein said current sensing device is a current driver and
2 temperature compensation circuit comprising an error amplifier, a current sensing resistor and
3 at least two reference voltage resistors.

1 7. The circuit of claim 6, wherein said current driver and temperature compensation
2 circuit further comprises a transistor as a power driver.

3 8. The circuit of claim 1, further comprising a low voltage power converter circuit.

1 9. The circuit of claim 8, wherein said low voltage power converter circuit produces
2 3 volts and 20 millamps when supplied with at least 0.8 volts input.

1 10. The circuit of claim 8, wherein said switching regulator device comprises:
2 a) a programmable reference voltage source;
3 b) an oscillation circuit; and
4 c) an error amplifier.

1 11. The circuit of claim 10, further comprising a super enhanced MOSFET.

1 12. The circuit of claim 1, wherein said circuit further comprises a power source.

1 13. The circuit of claim 12, wherein said power source is at least one battery.

1 14. The circuit of claim 12, wherein said power source is selected from the group
2 consisting of: one or more AAA batteries, one or more AA batteries, one or more C batteries
3 and one or more D batteries.

1 15. The circuit of claim 1, wherein said circuit is at least about 70% to about 99 %
2 efficient.

1 16. The circuit of claim 1, wherein said circuit is at least about 90% efficient.

1 17. The circuit of claim 1, wherein said circuit is at least about 97% efficient.

1 18. The circuit of claim 1, wherein said inductive storage device is wire wound with
2 an inductance between about 22 and 220 micro henries, wherein said switching regulator
3 device is a CMOS PWM/PFM-control step-up switching regulator, wherein said rectifier is
4 a Schottky diode, and wherein said current sensing device is a current driver and temperature
5 compensation circuit comprising an error amplifier, a current sensing resistor, at least two
6 reference voltage resistors, and a transistor as a power driver.

1 19. The circuit of claim 11, wherein said switching regulator device comprises a
2 programmable reference voltage source, an oscillation circuit, and an error amplifier, and
3 wherein said circuit further comprises a low voltage power converter circuit capable of
4 producing 3 volts and 20 millamps when supplied with a least 0.8 volts input and a super
5 enhanced MOSFET.

1 20. A method for directing the beam pattern of at least one light emitting diode,
2 comprising the steps of: placing at least one primary lens in the beam path of said light
3 emitting diode.

1 21. The method of claim 20, further comprising the steps of: placing a zoom lens in
2 a directed beam pattern from said at least one primary lens and varying the distance between
3 said at least one primary lens and said zoom lens to focus the beam pattern of said light
4 emitting diode.

1 22. An illumination device, comprising: a circuit comprising an inductive storage
2 device, a switching regulator device, a rectifier, a filter, and a current sensing device.

1 23. The illumination device of claim 22, further comprising at least one light emitting
2 diode which is powered by said circuit.

- 1 24. The illumination device of claim 22, further comprising a power source.
- 1 25. The illumination device of claim 24, wherein said power source is at least one
2 battery.
- 1 26. The illumination device of claim 22, wherein said inductive storage device is wire
2 wound with an inductance between about 22 and 220 micro henries, wherein said switching
3 regulator device is a CMOS PWM/PFM-control step-up switching regulator, wherein said
4 rectifier is a Schottky diode, and wherein said current sensing device is a current driver and
5 temperature compensation circuit comprising an error amplifier, a current sensing resistor,
6 at least two reference voltage resistors, and a transistor as a power driver.
- 1 27. The illumination device of claim 22, wherein said power source is at least one
2 AAA battery, said switching regulator device comprises a programmable reference voltage
3 source, an oscillation circuit, and an error amplifier, and wherein said circuit further comprises
4 a low voltage power converter circuit capable of producing 3 volts and 20 millamps when
5 supplied with a least 0.8 volts input and a super enhanced MOSFET.
- 1 28. The illumination device of claim 22, wherein said device is a flashlight.
- 1 29. The illumination device of claim 22, wherein said device is a headlamp.
- 1 30. The illumination device of claim 22, further comprising at least one primary lens.
- 1 31. The illumination device of claim 29, further comprising a zoom lens.
- 1 32. The illumination device of claim 29, wherein said device is a flashlight.
- 1 33. The illumination device of claim 29, wherein said device is a headlamp.

1 34. The illumination device of claim 30, wherein said device is a flashlight.

1 35. The illumination device of claim 30, wherein said device is a headlamp.